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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,583	07/31/2003	Akihiro Oota	50857/DBP/A400	5005

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EXAMINER	
STREGE, JOHN B	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/632,583	OOTA, AKIHIRO	
	Examiner	Art Unit	
	John B. Strege	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/05/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Disclosure Requirement

1. Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.

The information is required to disclose a detailed description of the methods and technology used in the background of the specification pages 1-6. Specifically the paragraphs 15-20 of the specification discloses that conventionally, as a consequence, resolution is improved to secure the accuracy in distance measurement by interpolating pixels in each left original image and right original image photographed in stereo, respectively, when pattern-matching processing is performed. The paragraphs then go on to explain the different conventional methods carrying out this process.

This requirement is an attachment of the enclosed Office action. A complete reply to the enclosed Office action must include a complete reply to this requirement. The time period for reply to this requirement coincides with the time period for reply to the enclosed Office action.

Drawings

2. Figures 9-13B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct

any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-22 rejected under 35 U.S.C. 102(b) as being anticipated by the Applicant's admitted prior art (hereinafter "AAPA").

Regarding claim 1 the AAPA discloses a pattern-matching processing method, comprising an area generating step for generating a left area and a right area each having a given range from a left image and a right image photographed in stereo (paragraph 2 discloses that a stereoscopic distance measuring method is widely known as a three-dimensional measuring technique adopting image processing in which correlation of a pair of left and right images of an object photographed from different positions by a stereo camera composed of two cameras is found and the distance is found from the parallax of the same object using image processing), a pixel generating

step for generating an interpolation pixel between pixels contained in the left area or the right area, and a pattern-matching step for performing pattern matching using the left area and the right area (paragraph 15 discloses that conventionally resolution is improved to secure the accuracy in distance measurement by interpolating pixels in each left original image and right original image photographed in stereo when pattern matching processing is performed).

Regarding claims 2-3, the AAPA discloses interpolating pixels in each left original image and right original image photographed in stereo when pattern matching processing is performed (paragraph 15).

Regarding claim 4, the AAPA discloses a pattern-matching processing method, as set forth in claim I, wherein pixel interpolation is performed on a left area and a right area containing a pixel at the center, the matching position of which has been specified by pattern matching based on the left area and the right area, in said pixel generating step (paragraph 16).

Regarding claim 5, the AAPA discloses a pattern-matching processing method, as set forth in claim 1, wherein pixel interpolation is performed on a right area containing a pixel at the center, the matching position of which has been specified by pattern matching based on the left area and the right area, in said pixel generating step (paragraphs 15-16).

Regarding claim 6, the AAPA discloses a pattern-matching processing method, as set forth in claim 1 wherein, after pixel interpolation is performed between two transversely adjacent pixels in said left area or said right area, pixel interpolation is

performed between two vertically adjacent pixels relating to the position to be interpolated, in said pixel generating step (paragraph 18).

Regarding claim 7, the AAPA discloses a pattern-matching processing method, as set forth in claim 1 wherein, after pixel interpolation is performed between two transversely adjacent pixels in said left area or said right area, pixel interpolation is performed between two vertically adjacent pixels based on the average value of plural pixels surrounding the position to be interpolated, in said pixel generating step (paragraph 19).

Regarding claim 8, the AAPA discloses pattern-matching processing method, as set forth in claim 7, wherein the plural pixels surrounding the position to be interpolated are weighted when the average value is calculated, in said pixel generating step (paragraph 53).

Regarding claim 9, the AAPA discloses a pattern-matching processing method, as set forth in claim 7, wherein pixel interpolation is performed starting from the pixel position at which the number of pixels surrounding the position to be interpolated is largest, which is the target for which the average value is calculated, in said pixel generating step (paragraph 16 discloses that the interpolation is performed at a pixel surrounded by 8 pixels).

Regarding claim 10, the AAPA discloses a pattern-matching processing method, as set forth in claim 7, wherein said average value is calculated after weighting a value less than 1 to the already interpolated pixels among the plural pixels surrounding the position to be interpolated, in said pixel generating step (paragraph 53).

Regarding claim 11, the AAPA discloses A pattern-matching processing method, as set forth in claim 1, wherein pixel interpolation is performed based on two pixels adjacent to each other only in the transverse direction in said left area and said right area, in said pixel generating step (paragraph 19).

Claim 12 is similarly analyzed to claim 1, except claim 12 has the additional limitation of measuring the distance to an object that is photographed by the images which is described in the AAPA (paragraph 2).

Claims 13-22 are similarly analyzed to claims 2-11.

5. Claims 1 and 12 rejected under 35 U.S.C. 102(e) as being anticipated by Nishigaki et al. USPN 6,853,738 (hereinafter "Nishigaki").

Regarding claim 1, Nishigaki discloses a pattern-matching processing method, comprising an area generating step for generating a left area and a right area each having a given range from a left image and a right image photographed in stereo, a pixel generating step for generating an interpolation pixel between pixels contained in the left area or the right area, and a pattern-matching step for performing pattern matching using the left area and the right area (figure 1, col. 5 lines 33-64).

Regarding claim 12, Nishigaki discloses An image processing apparatus measuring the distance to an object that is photographed as images, by performing pattern-matching processing based on left and right images photographed by a stereo camera, and comprising a pixel generating unit for generating a left area and a right area each having a fixed range from the left image and the right image and for

generating interpolation pixels between pixels contained in the left area or the right area, a pattern-matching processing unit having a pattern-matching unit performing pattern matching on the left area and the right area, and a distance measuring unit for calculating the distance from the difference in positions of the left image and the right image based on the matching position specified by performing pattern matching on the left area and the right area (figure 1, col. 5 lines 33-64).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

USPGPUB 2003/0169931 Coding dynamic filters.

USPGPUB 2003/0059089 Block Matching at the Fractional Pixel Level for Motion Estimation.

USPN 5,754,692 Picture Coincidence Detecting Apparatus and Method.

USPN 6,381,360 Apparatus and Method for Stereoscopic Image Processing.

USPGPUB 2001/0055063 Position detection apparatus.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John B. Strege whose telephone number is (571) 272-7457. The examiner can normally be reached on Monday-Friday between the hours of 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JS

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